

The herpetofauna of the oceanic islands in the Santorini-archipelago, Greece

(Reptilia)

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Abstract

The islands of the Santorini-archipelago have never been object of intensive herpetological investigations, although they are the only definitely oceanic islands in the Aegean. The authors also spent a short time there on their excursion to Greece in 1974. There are several reptiles on record on these islands, but further studies may be useful. Only four species occur on Santorini with certainty (*Hemidactylus turcicus turcicus*, *Podarcis erhardi myconensis*, *Telescopus fallax pallidus* and *Elaphe situla*). Compared to an island of the same size in the definitely non-oceanic northern Cyclades, Santorini is very poor in reptile life. The authors state, that the population of *Telescopus fallax* on Thira does not belong to *T. f. fallax*, but to *T. f. pallidus*. On the other hand, the populations of *Podarcis erhardi* on the islands of the Santorini-group are not related with *P. e. naxensis* but with *P. e. myconensis*.

1. Introduction

It is astonishing that the Santorini-archipelago has never been studied intensively by herpetologists, for we have to consider these islands as the only definitely oceanic ones in the Aegean. Here "oceanic" is used with special reference to the fauna; i. e. all animal life on Santorini was killed by the eruption of the volcano about 3500 years ago. The creatures now settling on both of the main islands, Thira and Thirasia, had to reach there over sea. PIEPER (1971) was the first to show, that the small islands inside the caldera are certainly of oceanic origin. Palea Kaimeni was built up by volcanic activities about 2200 years ago, Nea Kaimeni is only 200 years old, but the latter island was connected by a volcanic eruption in 1928 with the cliff Mikra Kaimeni, which arose out of the sea in 1570 (Fig. 1).

Our knowledge about the herpetofauna of Santorini is restricted to a few records reported by persons who spent a short time on these islands only, or who were working with reptiles and amphibians by the way (DOUGLASS 1892, Toldt & Ebner in EBNER 1912, Moser in AHL 1937, Schultz in WERNER 1938, BUCHHOLZ 1952, Moser in WETTSTEIN 1953, CLARK 1969 and PIEPER 1971 & in litt.). The authors also could spend only four days on the islands.

We have to assume that some of the records are based on error. It is rather difficult therefore, to compare the herpetofauna of Thira and those of the adjacent islands to such of other Cyclades.

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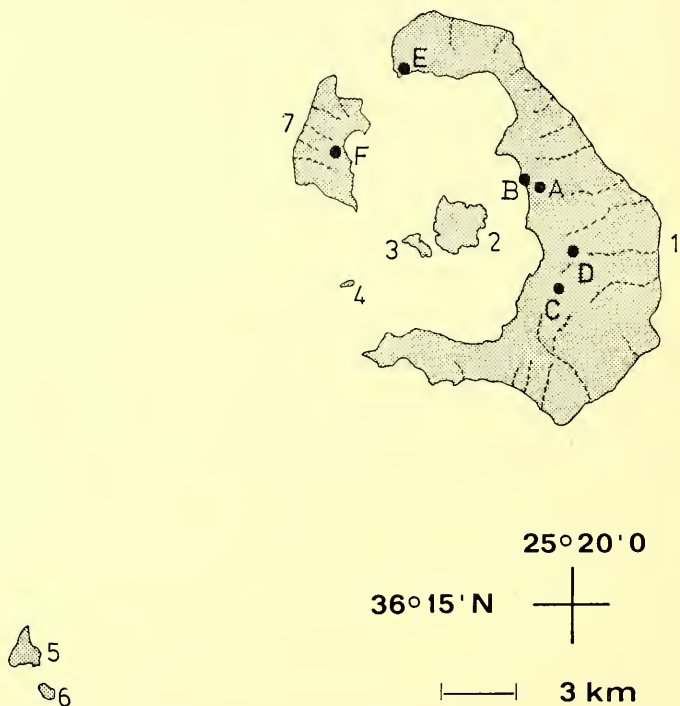


Fig. 1: The Santorini-archipelago and the Christiani-group of islands. The islands: 1 Thira (Santorini); 2 Nea Kaimeni; 3 Palea Kaimeni; 4 Aspronisi; 5 Christiani; 6 Askania; 7 Thirasia.

Villages and towns:

A Phira; B Scala; C Pyrgos; D Messaria; E Oia; F Manolas

2. Ecological remarks

Formerly Santorini had been a large, cone-shaped island, which acquired its present shape by the explosion of the volcano 3500 years ago. Only the edges of the former island remained, shaping the present islands Thira, Thirasia and Aspronisi. The outer edges of these islands fall away softly to the sea, but the inner coasts rise steeply to 300 or 400 metres. Especially the outer slopes are covered with enormous masses of ash and pumice. Hence the soil is very porous, and there are

only two perennial springs on Santorini; larger waters are completely absent. The soil is very fertile, leading to intensive agriculture on Thira; fallow land is rarely seen.

The small islands inside the caldera mainly consist of lava. Palea Kaimeni is rather densely overgrown with bushes; Nea Kaimeni consists mainly of barren lava and there are sparse meadows only there where the island Mikra Kaimeni formerly existed. Even today volcanic activities are observed in the archipelago — the last eruption of Nea Kaimeni was in 1950.

3. The herpetofauna

We consider the following records as doubtful and therefore they are omitted from the checklist: *Cyrtodactylus kotschy* (Palea Kaimeni, DOUGLASS 1892), *Chalcides moseri* (Thira, Moser in AHL 1937), *Elaphe quatuorlineata* and *Coluber caspius* (Thira, CLARK 1969).

Although it is possible that DOUGLASS observed *Cyrtodactylus kotschy* on Palea Kaimeni, it was never observed again. Also DOUGLASS made no mention of *Hemidactylus turcicus*, which is a very common gecko on Santorini. In *Chalcides moseri* the existence of this animal as a species of its own seems to be very doubtful, and on the other hand the occurrence of this lizard in the Aegean is presumably dubious (WETTSTEIN 1939, 1953); it has never been observed since the description by AHL. The records of *Coluber caspius* and *Elaphe quatuorlineata* are based only on skins (in the latter case on a piece of slough only a few centimetres long; LOTZE 1973). We think it is impossible to distinguish between *Coluber caspius*, *C. gemonensis* and *C. jugularis* by the slough only, and we suppose that skins of these snakes can even be taken for *Elaphe*-species. We have to state that also specimens of *E.-situla*- and *E.-quatuorlineata*-sloughs may be confused, and we think that first records based on such material are not acceptable without giving any reasons.

There are no indications for the occurrence of *Agama stellio* or *Tarentola mauritanica* which was assumed by DOUGLASS.

Hemidactylus turcicus turcicus (L.)

Thira: Schultz (WERNER 1938); Nea Kaimeni: Pieper (in litt.; see also PIEPER 1971)

Material: 5 specimens, 30th of September — 1st of October 1974, between Phira and the outer coast

We cannot find any differences between these animals and those of other Cyclades. These geckos frequented stone-walls in the evening. We also found them far away from houses, although WETTSTEIN (1953) has written, that *H. turcicus* only settles in the neighbourhood of buildings. These geckos may inhabit Thirasia too.

Podarcis erhardi myconensis (Werner)

Thira and Palea Kaimeni: DOUGLASS 1892; Nea Kaimeni: Toldt & Ebner (EBNER 1912); Thirasia: J. Moser (WETTSTEIN 1953)

Material: 2 specimens, 30th of September 1974, Phira; 9 specimens, 30th of September — 1st of October, between Phira and the outer coast; 2 specimens, 2nd of October, in a dry river east of Phira; 1 specimen, 2nd of October, between Phira and Scala; 5 specimens, 1st of October, Nea Kaimeni; 1 specimen, 2nd of October, Palea Kaimeni

We also observed this lizard on Thirasia. It seems to be the most common reptile or even vertebrate in the archipelago. In contrast to the situation on the northern Cyclades on Thira *P. erhardi* was to be seen everywhere; on other islands it does not settle in the urban district, while on Thira it ranges the whole of the town including the small harbours Scala and Oia. Presumably the lizard reached the small islands inside the caldera by ship from these harbours.

Morphological investigation shows, that the populations of the archipelago are distinguished very well from *P. e. naxensis* by the number of supraciliar-granula (9-15 instead of 5-12; $m = 11$ instead of $m = 6$). Besides this, the colouration of the back is not reduced as in *P. e. naxensis*. So these lizards are very similar to *P. e. myconensis*, which has also more than 10 supraciliar-granula mostly and shows the typical pattern. The animals of Santorini differ from *P. e. erhardi* and the subspecies inhabiting the mainland of Greece by their occipitale-line and the absence of black spots on the gular. Although the lizard of Santorini may differ from the typical *P. e. myconensis* in the length of the hind leg and in the number of dorsal scales, we think that it would not be very useful to describe it as a subspecies of its own; there are so many subspecies of *P. erhardi* on record which are nearly indistinguishable, that there is no reason to make another one.

Elaphe situla (L.)

Thira (DOUGLASS 1892)

No material

Dr. H. Pieper informed us about a dead specimen of this snake which he observed on 11th of March 1971 on the road from Phira to Messaria.

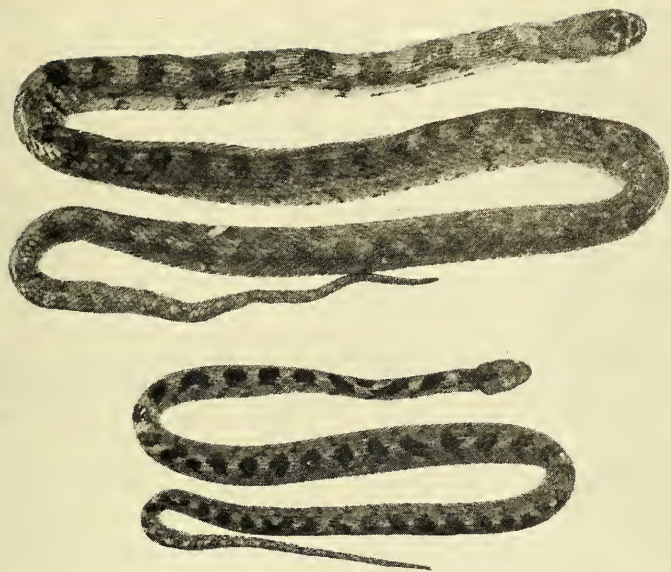
Telescopus fallax pallidus Stepanek

Thira: Moser (WETTSTEIN 1953)

Material: 3 specimens, 30th of September — 1st of October 1974, between Phira and the outer coast

Beside these, we found some sloughs which seem to belong to this species too. As BUCHHOLZ (1955) recorded this snake on the small island Christiani near Santorini (Fig. 1), it is not very surprising that Thira is inhabited by the same subspecies, and not by *T. f. fallax* as mentioned by WETTSTEIN (1953). BUCHHOLZ described the *T. fallax* of Christiani as a subspecies of its own, but according to WETTSTEIN (1957) we have to state that there are no differences between the specimens of Christiani and *T. f. pallidus* from Gavdos and Crete, neither by the description nor by the figures shown in the paper of BUCHHOLZ. As well as the *T. fallax* of Christiani, our snakes have 21 rows of dorsal scales at midbody. Compared to the *T. f. fallax* from Myconos, the colouration is rather reduced, which is typical in *T. f. pallidus* also. The details of our three specimens are listed in Tab. 1. See also Fig. 2.

Fig. 2: *Telescopus fallax*, a: *Telescopus fallax pallidus* from Thira (upper) and *T. f. fallax* from Myconos (lover); b: Head of *T. f. pallidus* from Thira; c: Head of *T. f. fallax* from Myconos
(Photos: M. Müller, Zoologische Staatssammlung München)



a



b



c

Table 1: Specimens of *Telescopus fallax pallidus* from Thira compared to specimens of *T. f. fallax* from Myconos — Vergleich zwischen *Telescopus fallax pallidus* von Thira und *T. f. fallax* von Myconos

Sex	n ventralia	n dorsal scales at midbody	n anales	n of dark spots between head and anus	Colouration
	<i>T. f. pallidus</i> (Thira)				
♀	219	21	2	50	reduced
♀	218	21	2	46	reduced-normal
juv.	212	21,5	1	43	reduced-normal
	<i>T. f. fallax</i> (Myconos)				
♀	190	19	2	43	normal
juv.	198	19	2	45	normal

Note: One skin found on Thira shows 20 rows of squamata at midbody

T. fallax seems to be common in autumn, perhaps because its prey, lizards, are then frequent. Animals in captivity also eat mice.

T. f. pallidus ranges from Gavdos and Crete (except Kouphonisi) to Christiani and Thira; the *T. f. fallax* from Kase may belong probably to this subspecies too, with its 21 rows of dorsal scales at midbody. A revision of the *T.-fallax*-populations would be very useful.

The material is located in the Zoologische Staatssammlung München, besides some specimens which were used for serological investigations.

4. Discussion

There are significant differences between the fauna of Thira and those of other islands in the Cyclades of similar size (Tab. 2). Although freshwater is there, neither amphibians nor tortoises are on record on Thira. At least species like *Rana ridibunda* could survive on Thira; more exclusive creatures are not to be found on such a dry island. Only two species of lizards are well recorded from the Santorini-archipelago; even together with both species of doubtful existence this is less in comparison to Myconos. The occurrence of two snake species is certain, while on Myconos at least four species are found, and the occurrence of *Coluber caspius*, *Elaphe situla* and *Eryx jaculus* is possible. On the small islands inside the caldera merely two species of reptiles are found. The herpetofauna of these islands seems to be very poor in comparison to the cliffs in the Paros-archipelago (GRUBER & FUCHS 1977).

We compare Thira to Myconos and not to one of the southern Cyclades, for we have only very poor information about the faunae and the origins of those islands, and some of them may be oceanic or semi-oceanic. Besides this, Santorini and Myconos have a similar number of inhabitants and both are well cultivated.

Certainly all the islands in the Santorini-archipelago are oceanic. The fauna is rather poor; amphibians and tortoises are totally missing. KINZELBACH (1975) stated, that the scorpion *Mesobuthus gibbosus* does not occur in the archipelago. All the reptiles inhabiting Santorini are widespread in the Aegean, and two of them show no subspecific differentiation there. In *Telescopus fallax*, we know several races from the Aegean, and in *Podarcis erhardi* there are many subspecies in Greece. But we have good reasons to assume that many of them are synonyma only. We can term all the species which are well recorded from Santorini as antropophile (s. WERNER 1938).

It is well known that *Hemidactylus turcicus* is secondarily distributed, and today it inhabites many parts of the world. If we state that Santorini is oceanic, we have also to say that all the reptiles there are secondarily distributed. The slight intra-specific differentiations in *Elaphe situla* and *Telescopus fallax* make this valid. In *Podarcis erhardi* we have to suppose that this lizard is distributed secondarily rather seldom, for small straits seem to be definitive barriers which often stop the expansion of its several subspecies.

Table 2: The herpetofaunas of the islands in the Santorini-archipelago; comparison of the herpetofauna of Thira with that of a definitely non-oceanic island (Myconos)

	Sanatorini-archipelago ¹⁾			Myconos ⁴⁾	
	Thira ³⁾	Thirasia	Palea Kaimeni	Nea Kaimeni	
<i>Rana ridibunda ridibunda</i>	—	—	—	—	+
<i>Mauremys caspica rivulata</i>	—	—	—	—	+
<i>Cyrtodactylus kotschyi</i> ssp.	—	—	?	—	—
<i>C. k. saronicus</i>	—	—	—	—	+
<i>Hemidactylus turcicus turcicus</i>	+	—	—	+	+
<i>Agama stellio stellio</i>	—	—	—	—	+
<i>Podarcis erhardi myconensis</i>	+	+	+	+	+
<i>Lacerta trilineata citrovittata</i>	—	—	—	—	+
<i>Ablepharus kitaibelii kitaibelii</i>	—	—	—	—	+
<i>Chalcides moseri</i>	?	—	—	—	—
<i>Coluber caspius</i>	?	—	—	—	? ²⁾
<i>Elaphe situla</i>	+	—	—	—	—
<i>E. quatuorlineata quatuorlineata</i>	?	—	—	—	+
<i>Telescopus fallax fallax</i>	—	—	—	—	+
<i>T. f. pallidus</i>	+	—	—	—	—
<i>Natrix natrix persa</i>	—	—	—	—	+
<i>Vipera ammodytes meridionalis</i>	—	—	—	—	+
Well-recorded species:	4	1	1	2	12
Recorded species including doubtful records:	7	1	2	2	13

1) The cliff Aspronisi has never been visited by any herpetologist; 2) Beutler got some skins on Myconos in 1975 which may belong to this species. 3) 76 qkm; 4) 75 qkm.

5. Zusammenfassung

Sehr wahrscheinlich ist die ganze Santorin-Gruppe im faunistischen Sinne als ozeanisch zu bezeichnen; mit Sicherheit gilt dies für die kleinen Inseln Nea Kaimeni und Paläa Kaimeni in der Kaldera. Aber auch bei Thira und Thirasia ist anzunehmen, daß die heute dort lebenden Tiere durch Sekundärverbreitung auf diese Inseln gelangten, da sehr wahrscheinlich die gesamte Fauna Altsantorins durch die Explosion des Vulkans vor 3500 Jahren völlig zerstört wurde. Für den ozeanischen Charakter der Inselgruppe spricht das Fehlen von Amphibien und Schildkröten, aber auch die geringe Artenzahl an Reptilien allgemein. Nur vier Arten können als sicher nachgewiesen gelten: *Hemidactylus t. turcicus*, *Podarcis erhardi myconensis*, *Elaphe situla* und *Telescopus fallax pallidus*. Alle diese Arten müssen als vagil gelten, da es ihnen sonst kaum möglich gewesen wäre, den Santorinarchipel zu besiedeln. Für die Cycladeneidechse gilt dies allerdings nur mit Einschränkungen. Die Katzennattern von Santorin gehören zur Unterart *Telescopus fallax pallidus*, deren Verbreitungsgebiet somit Kreta einschließlich Gavdos (aber ohne Kouphonisi), Thira, Christiani und Kosos umfaßt. Andererseits sind die Populationen der Cycladeneidechse aus dem Santorinarchipel nicht zu *Podarcis erhardi naxensis*, sondern zu *P. e. myconensis* zu rechnen.

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